

REMARKS

Claims 1-23, 25-29, 31-36, 38-43, 45-57 and 59-74 are currently pending in this application with claims 1, 3, 5, 7, 9, 11, 13, 15, 17-23, 66 and 74 being independent and claims 24, 30, 37, 44 and 58 being cancelled. Claims 3-23, 25-29, 31-36, 38-43, 45-57, 59-67, and 69-73 are allowed. Applicant thanks the Examiner for indicating the allowability of these claims.

Claims 1, 2, 68, and 74 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. No. 6,236,064 to Mase (Mase) in view of U.S. No. 5,585,658 to Mukai (Mukai) and U.S. No. 5,403,772 to Zhang (Zhang). Regarding these rejections, Applicant respectfully submits that the applied references, whether taken alone or in combination, fail to disclose or properly suggest all of the elements recited in at least independent claims 1 and 74.

For example, independent claim 1 recites: "forming a resist over a crystal semiconductor comprising a part to become a channel forming region; forming a dotted hole in said resist by patterning said resist using electron drawing method or FIB method; ... wherein said impurity regions have total width of W_{pi} in a direction of a channel width W , and a total width of said intrinsic or substantially intrinsic region is W_{pa} in said direction of said channel width W , where $W_{pi}/W = 0.1$ to 0.9 and $W_{pa}/W = 0.1$ to 0.9 ..."

The Office Action takes the position in paragraph 2 that (with emphasis added), "it is inherent ... that in order to implant ions into only parts of the channel formation region a mask has to be formed ... (f)urther it is inherent in the method of Mase that a dotted hole would have to be formed in the mask." In response, Applicant submits that, in order to be classified as inherent, characteristics of a prior art reference must necessarily result from, and exist in, that reference. See, e.g., M.P.E.P 2112. Hence, the Office Action takes the position that, in order to implant impurities into a region, it is necessary form a resist over the region, and then form a dotted hole in the resist..., as recited in claim 1.

Applicant respectfully submits that this is clearly erroneous. For example, impurities could be implanted into a region using a resist that has shape(s) other than a dotted hole, as might occur if a device required a different impurity distribution within the region in question than what is recited in claim 1.

Therefore, since Mase does not disclose “forming a resist over a crystal semiconductor comprising a part to become a channel forming region,” or “forming a dotted hole in said resist...,” Applicant submits that a proper rejection based on Mase would be required to establish a prima facie case of obviousness as to why, at the time of the invention, it would have been obvious to an artisan of ordinary skill to form a resist, and to form the particular pattern of “a dotted hole” in said resist that is recited in claim 1. Applicant further submits that such a rejection may not properly be made in the context of a Final Office Action, since such a rejection has not yet been made, and Applicant has therefore not had any opportunity to respond to such a rejection.

Further, the Office Action admits that, “Mase, Mukai, and Zhang do not disclose what percentage of the width of the channel region is occupied by the impurity region.” Despite this admission, the Office Action goes on to state that it would have been obvious to use “impurity regions hav(ing) total width of W_{pi} in a direction of a channel width W , and a total width of said intrinsic or substantially intrinsic region is W_{pa} in said direction of said channel width W , where $W_{pi}/W = 0.1$ to 0.9 and $W_{pa}/W = 0.1$ to 0.9 ,” as recited in claim 1, “in order to increase the carrier mobility of the channel region,” and refers to column 5, lines 27-40 of Mase.

However, this section of Mase, in pertinent party, merely states that carrier mobility in TFTs may be made larger by implanting oxygen, carbon, or nitrogen ions into only parts of the channel formation regions of the TFTs forming pixels...so that sensitivity to light may drop. In this case, it is possible to reduce the oxygen contents of the TFTs forming peripheral circuits. Thus, the carrier mobility in these TFTs are made larger.”

Thus, a reading of Mase appears to show that the discussed affect of implanting oxygen, carbon, or nitrogen ions into parts of pixel TFTs is to reduce oxygen contents of peripheral TFTs and thereby increase a carrier mobility of the peripheral TFTs. Thus, Applicant submits that the stated motivation of increasing carrier mobility of the (claimed) channel region is not supported in the cited portion of Mase.

Moreover, even if Mase is read as teaching “increasing carrier mobility of the channel region” in the manner described in the Office Action, there is nothing in Mase that suggests that

such a teaching would motivate an artisan of ordinary skill to obtain the claimed ratios of W_{pi}/W and W_{pa}/W . In other words, even if Mase discloses some teaching of increased carrier mobility in some channel region, there is no suggestion in any of Mase, Mukai, or Zhang that this increased carrier mobility is related to the claimed ratios of W_{pi}/W and W_{pa}/W , since, as stated in the Office Action, none of these references provide any discussion of these ratios at all.

The Office Action does state that “it is well known in the art to have impurity regions that have a total width of W_{pi} in a direction of a width W , and a total of the intervals in W_{pa} in a direction of the width, wherein $W_{pi}/W = 0.1$ to 0.9 and $W_{pa}/W = 0.1$ to 0.9 .” However, Applicant submits that this statement is out of place, since the assertion that “it is well known” has no bearing on the pertinent inquiry of whether the subject matter at issue **was well known at the time of the invention**. Further, to the extent that the assertion is maintained, Applicant respectfully requests that the Examiner provide evidence supporting the assertion (see MPEP 2144.03, and, in particular, MPEP 2144.03(C), which states that “if Applicant challenges a factual assertion as not properly Officially Noticed or not properly based upon common knowledge, the Examiner must support the finding with adequate evidence.”).

Based on the above, Applicant respectfully submits that claim 1 is in condition for allowance, so that dependent claims 2 and 68 are allowable for at least the same reasons. Independent claim 74, which recites a similar combination of features, is therefore also believed to be in condition for allowance for at least the same reasons.

Based on the above, and since all remaining pending claims have already been allowed, Applicant submits that all claims are in condition for allowance, and such action is hereby requested in the Examiner's next official communication.

Applicant : Yamazaki, et al.
Serial No. : 09/736,724
Filed : December 13, 2000
Page : 23 of 23

Attorney's Docket No.: 07977-175002 / US3397D1

Enclosed is a check in the amount of \$420.00 for a Two-Month Extension of Time.
Please apply any additional charges or credit any overpayments to deposit account 06-1050.

Respectfully submitted,

Date: _____

August 30, 2004



William G. Hughes, Jr.
Reg. No. 46,112

Customer No. 26171
Fish & Richardson P.C.
1425 K Street, N.W.
11th Floor
Washington, DC 20005-3500
Telephone: (202) 783-5070
Facsimile: (202) 783-2331
WXH/adt
40235859.doc